

CLAIMS

What is claimed is:

1. A method for transforming *Parthenium argentatum* (Guayule) with a target gene, comprised of the steps of:
 - a. dipping and saturating leaf strips of Guayule, previously grown in sterile culture, in a solution of *Agrobacterium* which has been transformed with a vector containing a target gene; and
 - b. introducing said leaf strips to a nutrient subculture and to controlled light conditions, and maintaining said leaf strips under said controlled light conditions in said nutrient subculture until shoot formation occurs, thus producing transformed plantlets of Guayule.
2. The method of claim 1, wherein the controlled light conditions are comprised of alternating periods of darkness and fluorescent light maintained at $<15 \mu\text{mol m}^{-2} \text{s}^{-1}$ intensity.
3. The method of claim 1, wherein the controlled light conditions are comprised of alternating periods of darkness and fluorescent light maintained at between $0\text{-}5 \mu\text{mol m}^{-2} \text{s}^{-1}$ intensity.
4. A method of transforming *Parthenium argentatum* (Guayule) with a target gene, comprised of the steps of:
 - a. dipping and soaking leaf strips of Guayule, previously grown in sterile culture, in a solution of *Agrobacterium* which has been transformed with a target gene;
 - b. introducing said leaf strips to selectable media; and
 - c. slowing the metabolism of said leaf strips held in a nutrient matrix until shoot formation occurs, thus creating transformed plantlets.
5. The method of claim 4 wherein the metabolism is slowed by exposure to and maintenance of controlled light conditions.
6. The method of claim 5 wherein the controlled light conditions are further defined as

alternating periods of darkness and light that is $<15 \mu\text{mol m}^{-2} \text{s}^{-1}$ intensity.

7. A transgenic Guayule line created by:
 - a. dipping and soaking leaf strips of Guayule, previously grown in sterile culture, in a solution of *Agrobacterium* which has been transformed with a target gene and introducing said leaf strips to selectable media;
 - b. ameliorating the adverse wounding response of said saturated leaf strips to *Agrobacterium* infection through application of low light conditions; and
 - c. inducing shoot elongation and rooting, thus creating a transgenic line of Guayule.
8. The transgenic Guayule plant of claim 7, wherein the low light conditions are further defined as alternating periods of darkness and exposure to white fluorescent light with an intensity of $<15 \mu\text{mol m}^{-2} \text{s}^{-1}$.
9. The transgenic Guayule plant of claim 7, wherein the low light conditions are further defined as alternating periods of darkness and exposure to white fluorescent light with an intensity of $<5 \mu\text{mol m}^{-2} \text{s}^{-1}$.
10. A method for transforming *Parthenium argentatum* (Guayule) with a target gene, comprised of the steps of:
 - a. preparing leaf strips from Guayule plants previously grown in sterile culture, and holding said leaf strips in reduced light conditions for at least 3 days;
 - b. preparing *Agrobacterium* liquid suspension containing a binary vector with at least one target gene in its T-DNA;
 - c. soaking said leaf strips in the *Agrobacterium* suspension;
 - d. introducing said leaf strips to a selectable medium;
 - e. transferring said leaf strips into a nutrient culture, and exposing the leaf strips to controlled light conditions until proliferation occurs, thus producing a colony of transformed Guayule plants.
11. The method of claim 10, wherein the reduced light conditions are further defined as alternating periods of darkness and exposure to white fluorescent light with an

intensity of $<15 \mu\text{mol m}^{-2} \text{s}^{-1}$.

12. The method of claim 10, wherein the controlled light conditions are further defined as alternating periods of darkness and exposure to white fluorescent light with an intensity of $<5 \mu\text{mol m}^{-2} \text{s}^{-1}$.